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BIRDS COLLECTED DURING THE WHITNEY SOUTH SEA EXPEDITION. XXXIV[1]

THE DISTRIBUTION AND THE MIGRATION OF THE LONG-TAILED CUCKOO (*URODYNAMIS TAITENSIS* SPARRMAN)

BY CARDINE BOGERT

A great many papers are published every year on the migrations of the birds of the Northern Hemisphere. Little, however, is known of the extensive wanderings of the southern birds, although they are in many ways even more fascinating. The wonderful material of the wandering New Zealand cuckoo, *Urodynamis taitensis*, in the collection of The American Museum of Natural History makes it possible to draw a picture of the migration of this species which complements in many respects the scattered information published in the past. A short description of the species and an historical review will be given before I enter the detailed discussion of the migrations. I much appreciate the kind assistance Dr. Ernst Mayr has given me during the preparation of this report. Mr. J. Sterling Rockefeller gave me his kind permission to use extensive notes that he also had collected on this species. Messrs. Berlioz, Friedmann, Junge, Kinnear, Peters, de Schauensee, Stresemann and Yamashina kindly sent me full information on specimens of the collections of which they are in charge.

Urodynamis taitensis[2] (Sparrman)

Cuculus taitensis SPARRMAN, 1787, 'Museum Carlson.,' fasc. II, No. 32.—Tahiti, Society Islands.

Cuculus tahiticus GMELIN, 1788, 'Syst. Nat.,' I, pt. 1, p. 412.—Tahiti.

Cuculus perlatus VIEILLOT, 1817, 'Nouv. Dict. d'Hist. Nat.,' nouv. ed., VIII, p. 232.—Tahiti, Society Islands.

Cuculus fasciatus FORSTER, 1844, 'Descr. Anim.,' p. 160.—Tahiti.

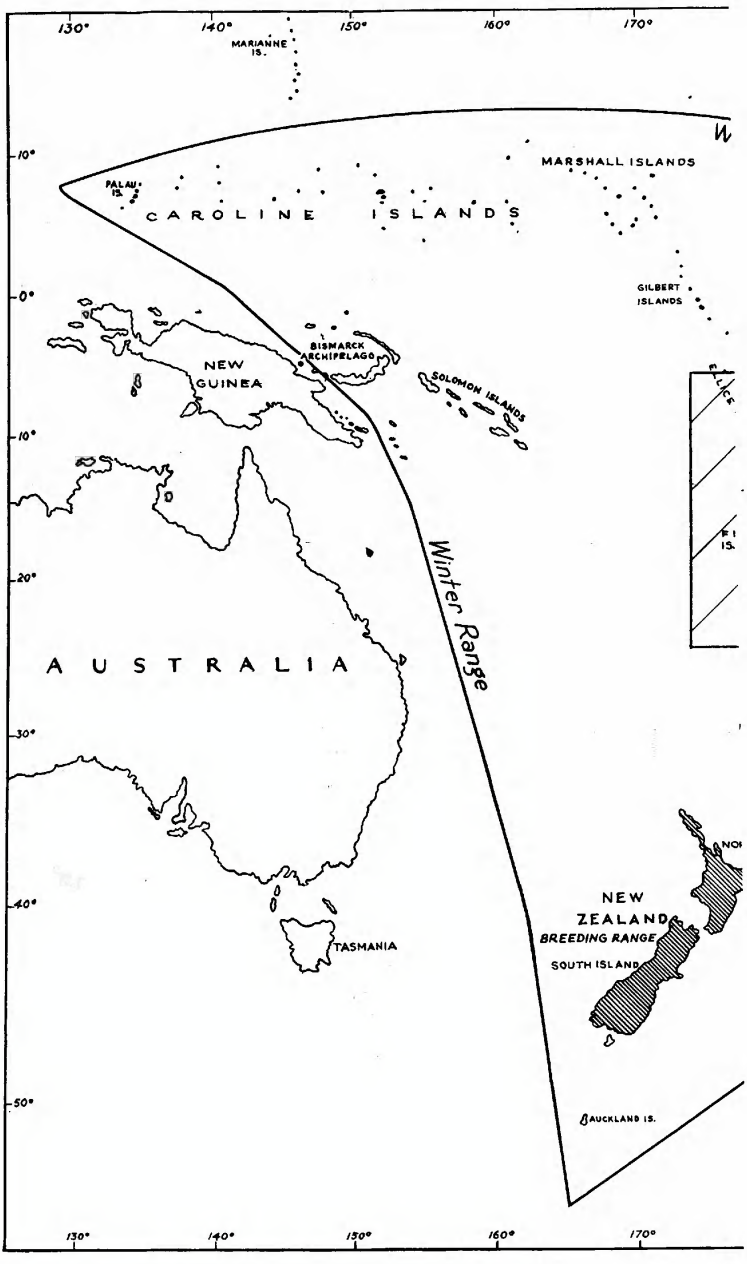
Eudynamis cuneicauda PEALE, 1848, 'U. S. Explor. Exped.,' Birds, p. 139.—Ovalau, Fiji Island.

Urodynamys taitensis philetes WETMORE, 1917, Proc. Biol. Soc. Wash., XXX, p. 1.—Otago Prov., New Zealand.

Urodynamys taitensis belli MATHEWS, 1918, Bull. Brit. Orn. Club, XXIX, p. 24.—Norfolk Is.

[1] Previous papers in this series comprise American Museum Novitates Nos. 115, 124, 149, 322, 337, 350, 356, 364, 365, 370, 419, 469, 486, 488, 489, 502, 504, 516, 520, 522, 531, 590, 609, 628, 651, 665, 666, 709, 714, 820, 828, 912 and 915.

[2] Also often quoted as *taitiensis* or *tahitensis*, although the original spelling is *taitensis*.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GILBERT ISLANDS
BISMARCK ARCHIPELAGO
NEW GUINEA
SOLOMON ISLANDS
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Winter Range
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AUSTRALIA
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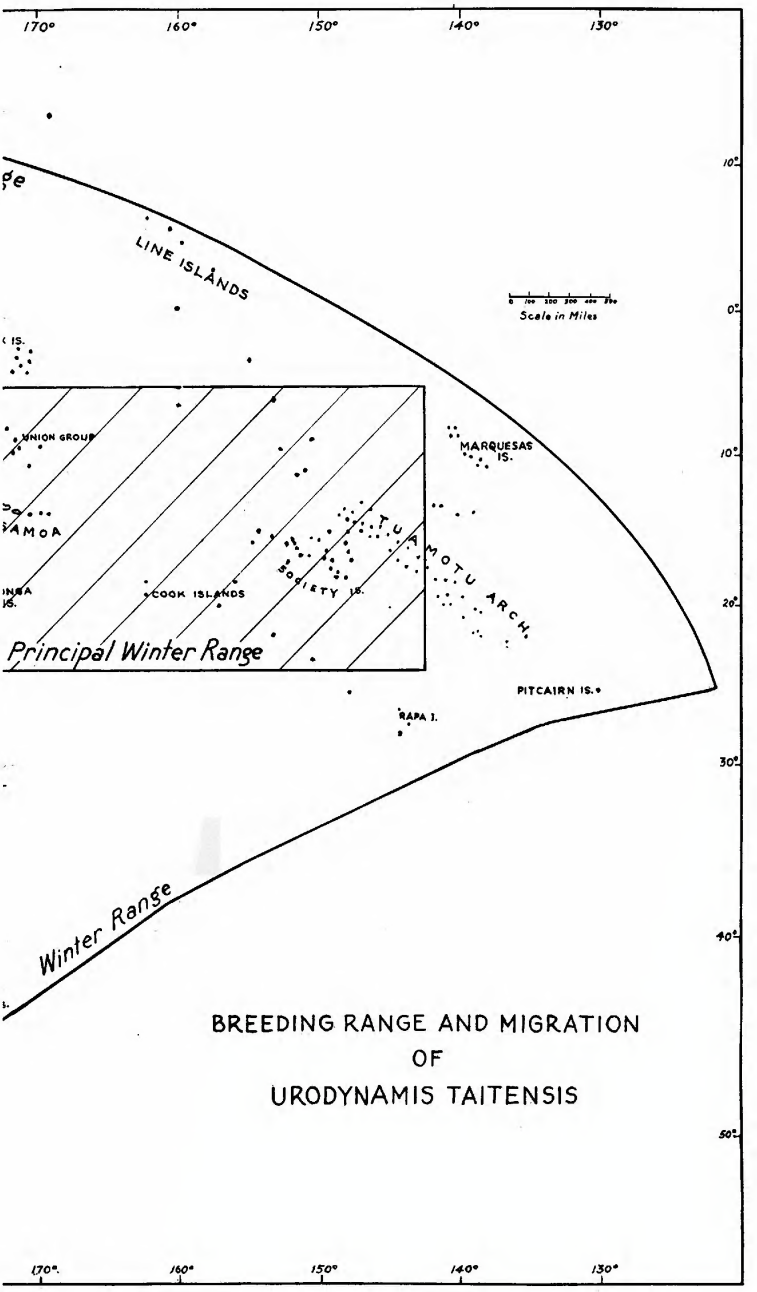

BREEDING RANGE AND MIGRATION
OF
URODYNAMIS TAITENSIS

ADULT MALE.—General coloration above dark brown, with rufous bars and spots, below white, with dark brown stripes. Crown and nape blackish brown with narrow rufous shaft-streaks; back, scapulars and rump blackish brown, each feather with broad rufous bars and paler, sometimes whitish tips; upper wing-coverts similar to feathers of the back, but with the white tips more pronounced; wing-feathers dark brown with whitish rufous cross bars, each bar being more rufous near the shaft and white or whitish near the edge of the inner and outer web; under wing-coverts and axillaries deep or pale buff; tail-feathers with rufous and blackish bars of about equal width and whitish tips; supraloral spot and superciliary stripe whitish; ear-coverts dark brown with light streaks; under parts very variable whitish, buff or pale rufous, with few or numerous longitudinal stripes, which are most pronounced on breast and flanks; under tail-coverts whitish with blackish bars.

ADULT FEMALE.—Very similar to male, but slightly smaller, averages above duller and darker, particularly in the rufous markings; white tips of the scapulars more pronounced; rufous wash of throat and rest of under parts more pronounced. There is considerable individual variation and some individuals cannot be separated from males.

IMMATURE.—Entire upper parts spotted with white, bars on tail whitish or buff, not deep rufous.

Wing: ♂ ad. 186–192 (189.9); ♀ ad. 175–185 (181.4).

Tail: ♂ ad. 221–236; ♀ ad. 196–230.

The great amount of individual variability and the uncertainty about the breeding range has misled several authors to redescribe this species. As late as 1917, Wetmore separated the New Zealand birds as a distinct subspecies from the Polynesian birds, not realizing that the latter were only migrants from New Zealand. His material consisted apparently of 3 or 4 New Zealand birds and 2 from Polynesia, and the characters he gives are all within the range of individual variation of either New Zealand or Polynesian birds. There is no definite evidence that the species reproduces on Norfolk Island and Mathews' statement that Norfolk Island birds were "lighter above" is not true.

RANGE.—The species breeds, as far as we know, only on New Zealand. On its migration and during the winter, it is found accidentally on Chatham and Kermadec Is., Auckland Is., and regularly in Melanesia, Micronesia, as far west as Palau, and Polynesia, as far east as the Marquesas Is.

HISTORY OF DISCOVERY

Dr. Sparrman and J. R. Forster, who accompanied Capt. Cook during his second voyage, first discovered *Urodynamis taitensis* at Tahiti in August, 1773. In February, 1777, when Cook touched Queen Charlotte's Sound, N. Z., on his last voyage, we find mention of this species once again, the first report of this species at New Zealand. In

1779, Buffon (IV, p. 376) refers to "Le Couou brun varié de Noir," and states its habitat as: "Islands of the Pacific, Tahiti, New Zealand, Tonga-taboo," obviously basing his notes on information received from the naturalists of Cook's voyages. For more than sixty years no new information was obtained on the occurrence of *Urodynamis* in Polynesia. The species is frequently mentioned in the ornithological publications of that period, but all these notes refer to the above-mentioned observations. A complete list of references can be found in Wiglesworth, 1891, 'Aves Polynesiae,' p. 11.

In the forties of the last century the species was found in Polynesia by several of the large expeditions (Peale, etc.), and after the middle of the century the number of the recorded specimens increased very rapidly, particularly owing to the activities of the collectors of the Museum Godeffroy. During all that time it was supposed that the species was a resident of Polynesia, except by the New Zealand ornithologists who had at that time already found out that it left its breeding range during the winter.

"It is migratory, says Dr. Dieffenbach in 1843, and appears on the coast of New Zealand in the month of December." (Buller, 1873, B. N. Z., p. 73.)

The migratory habits of this species, the sudden disappearance in New Zealand, and the lack of any breeding activities in its winter range baffled both natives and naturalists, and has resulted in some very curious beliefs which seem worth recording.

Rev. Wm. Yates in 1835, when in New Zealand, writes, that according to the natives, "this bird secures itself during the winter months in the holes of the puriri-trees. . . . . "

Rev. Taylor in his book, 'Te Ikaa Mani,' reports: "The Long-tailed Cuckoo in the autumn buries itself in the mud of river beds and there hibernates till the following spring."

The belief that the species was a resident of Polynesia was so firmly rooted that several times supposed eggs of the species were collected in its winter range, and that even detailed descriptions of its breeding habits were given. It was Finsch (1880, Ibis, p. 433) who first expressed his doubts: "I observed twice *Eudynamis taitensis* on Butaritari, Dec. 7, 1879. . . . . Except the cuckoo which apparently is only a migratory bird, there is no other land bird on the Gilberts."

Since no other land birds were known to exist on the Gilbert Islands, Mr. Swayne of Sydney presumes that it laid its eggs in the nest of the noddy tern (*Anous stolidus*). In fact, he writes that "he had seen this

cuckoo oust a noddy tern from its nest and take possession of it."(Proc. Zool. Soc., 1896, p. 934.) How he could believe that the young cuckoo could survive on the same diet as that of a young tern is rather astonishing.

Wetmore was deceived by such reports into considering the Polynesian birds an endemic resident subspecies (1917, Proc. Biol. Soc. Washington, XXX, p. 1).

Life History

From observations made in the last twenty years, it is now certain that *Urodynamis taitensis* reproduces exclusively on New Zealand and occurs in Micronesia, Melanesia and Polynesia only as a winter visitor. By the first of November most of the long-tailed cuckoos have returned to New Zealand and have started mating. In November and December, the bird is laying, and the young cuckoos appear in January and February (condensed from Fulton, 1903, Trans. New Zealand Inst., XXXVI pp. 113–145). In March they gather in small groups and set off on their (fall) migration to the tropical islands.

The long-tailed cuckoo of New Zealand belongs to the parasitic cuckoos. According to the observations of many ornithologists the reputed foster parents of this bird are[1]:
Turnagra capensis,[2] *Hemiphaga novaeseelandiae*, *Gerygone flaviventris*, *Pseudogerygone igata*, *Petroica macrocephala*,[2] *Miro australis*,[2] *Petroica toitoi*, *Rhipidura flabellifera*, *Mohoua ochrocephala*,[2] *Mohoua albicilla*,[2] *Zosterops lateralis*, *Finschia novaeseelandiae*, *Prosthemadera novaeseelandiae*, *Anthornis melanura*,[2] *Chloris chloris*.[2]

In spite of the intensive ornithological work carried on in New Zealand during the past 100 years, the eggs of this species remained unknown until last year. Erroneous descriptions, including that of a dwarf pullet's egg (!!), have been given by many authors (Ramsay, 1865, Ibis, p. 155; Nehrkorn, 1879, Journ. f. Ornith., p. 394; Buller, 1888, 'Birds of New Zealand,' 2nd Ed., I, p. 127; Fulton, 1903, Trans. New Zealand Inst., p. 141; Oliver, 1930, 'New Zealand Birds,' p. 426), but Stead is the first author to describe an egg of a size which would seem probable for such a small bird as *Urodynamis*. His description is as follows: "Ground colour white, tinted with cream, or creamy pink, freely spotted and streaked with purplish brown, and having under-

[1] E. F. Stead, 1936, Trans. and Proc. Roy. Soc. of New Zealand, LVI, part 2, pp. 182–184; Fulton, 1903, Trans. New Zealand Inst., XXXVI, p. 141; Oliver, New Zealand Birds, pp. 447–506.
[2] Egg of *Urodynamis taitensis* reported in nest. Species without [2] have been seen feeding young long-tailed cuckoo. The evidence in some of these cases is not conclusive.

lying spots of gray, the markings being larger and more numerous at the larger end of the egg. The shape is ovoid-elliptical, and the measurements in mm. of four specimens are: (in mm.) 23.5 × 17; 23 × 17.75; 22.75 × 17.5; 22.5 × 18." (Stead, Sept. 1936, Trans. Proc. Roy. Soc. New Zealand, LXVI, pp. 182–184.)

Time of Migration

Enough observations have been collected on New Zealand during the last century to enable me to draw a fairly correct picture of the migratory habit of this species. Its movements are somewhat obscured by the fact that the migratory urge is not equally strong in all individuals. Not all of them fly to the tropical winter quarters, but some remain in New Zealand throughout the winter and still others appear as stragglers on the outlying islands of the New Zealand region (Auckland Is., Chatham Is. and Kermadec Is.) or in different parts of New Zealand, itself. Many such cases have been reported by Fulton (*loc. cit.*) and elsewhere in the New Zealand literature.

The outline of the main migration is approximately as follows: This species arrives at New Zealand during October and through November. According to observers, *Urodynamis taitensis* arrives in groups, and a few solitarily, usually at night from the northeast (Fulton, *loc. cit.*). At first there are many more males than females. For a while they are rather quiet; in November, however, they become active.

The fall migration starts from New Zealand during February and throughout March. They begin to disappear, some gradually moving to North Island from where they leave, others probably leaving direct from the South Island, the young remaining till last (Fulton, *loc. cit.*). They have been seen in New Zealand assembling in groups up to about a dozen for migration at this time.

Migration Route and Winter Range

No attempt has been made to collect the exceedingly scattered literature on this subject, since Finsch published his account (1901, Notes Leyden Mus., XXII, pp. 120–125). Since then a number of additional records have been published, but what is more important, the Whitney South Sea Expedition had been in the field in the years 1921–1933 and has collected a superb series of this species from a wide range of localities. Information on unpublished material of other museums has also been available owing to the courtesy of the curators of these institutions. All in all, I have gathered information on about 200 specimens from

the range of the species outside of New Zealand, 130 of which are in the collections of The American Museum of Natural History (including the Rothschild Collection).

This extensive material permits a much more detailed description of the migration route and the winter quarters than has hitherto been possible. The latest authority on New Zealand birds (Oliver, *loc. cit.*, p. 426) writes: "Passes presumably through Norfolk Island and the Kermadecs on migration and winters in the islands of the Western Pacific." Information in other books is equally sketchy. It seems important to list in detail the complete records of this species collected by me.

A.—NEW ZEALAND REGION

(1) KERMADEC ISLANDS:—2 ♂, 1 ♀, Sunday I., May 15, June 11, Aug. 23, 1913, by Bell (Rothschild Collection).—2 specimens, by Dannefaerd (Rothschild Collection).—1 specimen, Sunday I., 1894, by Travers (Rothschild Collection).—1 specimen presented to Buller (1891, Trans. N. Z. Inst., p. 28).—1 specimen (Cheeseman, 1890, Trans. N. Z. Inst., p. 219).—A few remain all year, plentiful in March (Oliver, 1935, N. Z. Birds).—Numerous in October, heard every month in 1908 (Iredale, 1913, Trans. N. Z. Inst., pp. 78–92).

(2) NORFOLK ISLAND:—1 ♂, Nov. 2, 1912, by Bell (type of *U. t. belli* Mathews) (Rothschild Collection).—3 ♂, 1 ♀, Steels Pt., Oct. 30, Nov. 4, 1912, by Bell (Rothschild Collection).—1 ♂, Furney Lane, March 9, 1913, by Bell (Rothschild Collection).—1 ♂, Mt. Pitt, March 17, 1913, by Bell (Rothschild Collection).—1 specimen, by Metcalf Crowfoot (1885, Ibis, p. 270) (Mus. Comp. Zoöl. Cambridge).—3 specimens (Ramsay, 1888, Tab. List, p. 37).—Specimens (Hull, 1910, Proc. Linn. Soc. New So. Wales, p. 34).

(3) LORD HOWE ISLAND:—1 specimen shot (Hull, 1910, Proc. Linn. Soc. New South Wales, p. 34).—Spent winter (Fulton, 1903, Trans. N. Z. Inst., XXXVI, pp. 113–148).

(4) CHATHAM ISLAND:—Seen throughout winter (Fulton, *loc. cit.*).

(5) AUCKLAND ISLAND:—Seen throughout winter (Fulton, *loc. cit.*).

B.—SOUTHERN MELANESIA

(1) NEW CALEDONIA:—1 ♀ imm., Nouméa, April 8, 1875, by Germain (Mus. d'Hist. Nat., Paris).—1 ♂, June 17, 1881 (in Tristram Collection).—Specimens from streets of Nouméa, 2 showing nesting plumage, March 23, 1879, March 15, 2 on April 15, 1881 (Marie, 1877, Ibis, p. 362; Layard, 1882, Ibis, pp. 523, 543) (Brit. Mus.).

(2) NEW HEBRIDES:—1 ♂, Ambrym, Aug. 14, 1926 (Whitney S. S. Exp.).—1 ♀, Aniwa, March 24, 1936 (L. Macmillan).—1 specimen, Efate (Vate) Is., June 12, 1877, shot by native (Layard, 1878, Ibis, p. 27) (Brit. Mus.).—Ambrym, feathers worn by native (Layard, 1878, Ibis, p. 27).

(3) SANTA CRUZ:—1 ♀, Tinakula, March 2, 1927.—1 ♂, Lomlom I., Reef Is., Oct. 9, 1926.—1 ♀, Nepani, Swallow I., Oct. 15, 1926.—1 ♂, Fenualoa, Reef Is., Oct. 11, 1926 (all Whitney S. S. Exp.).

C.—NORTHERN MELANESIA

(1) SOLOMON ISLANDS:—1 ♂, Ramos I., Sept. 5, 1927.—1 ♀, Tiara, Aug. 25, 1927.—1 ♀, Malaita I. (3000 ft.), April 15, 1930.—1 ♀, Gower I., April 5, 1930, 1 ♂, Sept. 21, 1930.—1 ♂, Ontong Java, Oct. 4, 1930.—1 ♂, Nissan, Aug. 10, 1929.—1 ♀, Oema I., May 11, 1928 (all Whitney S. S. Exp.).—2 ♂, Aola, Guadalcanar, April 20, by Woodford, May 20, 1887 (Grant, 1888, Proc. Zool. Soc. London, p. 191), 1 ♂ imm., Guadalcanar, April 17, 1901, by Meek.—1 ♀, Rendova, Feb. 20, 1904, by Meek (Nov. Zool., XII, p. 258).—3 ♀, Nissan I., Sept. 2, 12, 15, 1924, by Eichhorn (all Rothschild Collection).—3 specimens, Savo (Ramsay, 1879, Proc. Linn. Soc. New South Wales, IV, p. 20; 1882, Ibis, p. 143).

(2) BISMARCK ARCHIPELAGO:—1 ♂, Duke of York Is., July 19, 1879, by Kleinschmidt (Layard, 1880, Ibis, p. 300) (Brit. Mus.).—1 ♀, April, 1878, by Brown (Tristram Collection).—1 imm., Vuatom, May 11, 1933, by O. Meyer (Orn. Monatsber., XLI, p. 153) (Berlin Mus.).—1 specimen, Blanche Bay, New Britain (Finsch, 1881, Ibis, p. 537).

(3) NEW GUINEA REGION:—1 ♂(?), St. Aignan, Louisiade Arch., Sept. 10, 1897 (Rothschild Collection).

D.—MICRONESIA

(1) PALAU:—1 specimen (Finsch, 1875, Journ. Mus. Godef., VIII, p. 49).

(2) CAROLINE ISLANDS:—1 ♂, Ruk I., July 1, 1896, by Owston (Rothschild Collection).—2 ♂, 1 ♀, Kusaie, March 15, April 5, April 15, 1931 (Whitney S. S. Exp.).—1 ♂, Ponape, Aug. 15, 1934, by Ikkaku (Yamashina Collection, Tokyo).—2 ♂, Truk, May 9, 25, 1931, by H. Orii (Yamashina Collection, Tokyo).—1(?), Ponape, March 2–17, 1880, by Kubary (Finsch, 1881, Ibis, p. 113).—1 ♀, Ponape, Sept. 1873, by Kubary (possibly repetition) (Proc. Zool. Soc. London, 1877, p. 778; id., 1900, Notes Leyden Mus., p. 120; id., 1876, Journ. Mus. Godef., V, Heft 12, p. 19).

(3) MARSHALL ISLANDS:—1 ♂, Iringlove, Oct. 24, 1931, by H. Orii.—1 ♂, Wozzie, Sept. 23, 1931, by H. Orii.—1 ♀, Auru, Sept. 25, 1931, by H. Orii.—2 ♀, Jaluit, Jan. 3, 6, 1933, by Kawakami (all Yamashina Collection, Tokyo).—1 ♀, with breeding patch (1893, Ibis, pp. 210–215).—1 specimen, Ratak, Eastern Chain, Oct. 21, 1879, brought in by a native (Finsch, 1880, Ibis, p. 300; id., 1900, Notes Leyden Mus., p. 123).—Seen twice, Jaluit, Aug. 5, 21, 1879, by Finsch (1880, Ibis, p. 220).

(4) GILBERT ISLANDS:—Seen twice, Butaritari, Dec. 7, 1879, by Finsch (1880, Ibis, p. 433).—1 specimen seen from Makin I., Butaritari, 1895 (North, 1896, Proc. Zool. Soc. London, p. 300).

E.—CENTRAL POLYNESIA

(1) FIJI ISLANDS:—1 ♂, Nanuku Levu I., Nov. 26, 1924.—1 ♀, Vanua Vatu I., Sept. 13, 1924.—2 ♂, Turtle I., June 17, 1925.—1 ♀, Nakuemanu, Nov. 27, 1924 (all Whitney S. S. Exp.).—1 specimen, Taviuni (Layard, 1876, Ibis, p. 144).—Levuka Ovalau, Mokani, Wakaia (Layard, 1876, Ibis, p. 391).—1 ♀, Wakaia, Sept. 12, 1875, by Layard (Brit. Mus.).—1 imm., Taviuni, Aug. 20, 1923, by C. A. Wood (1925, Ibis, p. 835) (U. S. Nat. Mus.).—1 specimen, Ovalau, May, by Peale, (Cassin, 1885, Expl. Exp.) (type of *Eudynamis cuneicauda* Peale) (U. S. Nat. Mus.).

(2) TONGA ISLANDS:—1 ♂, 1 ♀, Fanua Lai Is., Aug. 15, 1925.—1 ♀, Nomuka I., July 22, 1925.—1 ♂, Ata I., July 14, 1925.—1 ♂, Vavau, Aug. 11, 1925 (all Whit-

ney S. S. Exp.).—2 ♀, Tongatabu, April 10, May 11, 1889, by Lister (Brit. Mus.).—1 specimen, Eua, May 29, 1889, by Lister (Brit. Mus.).—1 ♂ imm., Eua, Aug., 1876, by Hübner (Finsch, 1877, Proc. Zool. Soc. London, p. 773).—1 specimen, Tongatabu Gray, 1859, B. of Trop. Is., p. 35) (Brit. Mus.).

(3) SMALL ISLANDS OF CENTRAL POLYNESIA (Niue, Niuafu, Wallis, Fotuna Is.):—3 ♂, 3 ♀, Wallis Is., April 27, 29, 30, 1925.—1 ♀, 1 ♂, Fotuna I., May 7, 1925, July 30, 1925.—1 ♂, Alofa I., May 12, 1925.—1 ♂, 1 ♀, Danger Is., March 1, 1924.—1 ♂, Niuafu Is., Aug. 17, 1925 (all Whitney S. S. Exp.).—1 specimen, Niue I., by Earl of Ranfurly (Brit. Mus.).—1 specimen, Niuafu I., Oct. by Hübner.

(4) SAMOA ISLANDS:—1 ♂, Tutuila, Nov. 28, 1923.—1 specimen, Amer. Samoa (data lost).—1 ♀, Tau Manua, Dec. 21, 1923.—1 ♀, Ofu Manua, Jan. 10, 1924.—2 ♀, Anuu I., Jan. 11, 1924.—1 ♀, Olosenga, Manua Is., Jan. 4, 1924 (all Whitney S. S. Exp.).—1 ♂, 2(?), Upolu, by Krause (Rothschild Collection ex Mus. Godeffroy).—1 ♀, Upolu, Mar. 6, 1895, by Woodford (Rothschild Collection).—1 specimen, 1895, by Woodford (Rothschild Collection).—1 specimen, 1911, Mitchell (Rothschild Collection).—1 ♂, 1 ♀, by Whitmee (Layard Collection, Brit. Mus.).—1 specimen, Tutuila, June 9, 1889, by Lister (Brit. Mus.).—1 adult, Aug., 1886, by Krause (Finsch, 1900, Notes Leyden Mus., XXII, p. 120) (Leyden Mus.).—Less abundant, never seen alive (Whitmee, 1875, Ibis, p. 437).—1 imm. (Whitmee, Cat. Brit. Birds, XIX, p. 315) (Brit. Mus.).—1 specimen (Layard, Dec., 1876, Proc. Zool. Soc. London, p. 491).—1 ♂ ad., Upolu, May, 1898, by Thilenius (Berlin Mus.).

(5) UNION, ELLICE, PHOENIX ISLANDS:—3 ♂, 1 ♀ (?), Fakaafo I., Union group, April 2, 3, 4, 1924 (Whitney S. S. Exp.).—1(?), Funafuti, Ellice Is., Dec., 24, 1899, by Townsend (1919, Bull. Mus. Comp. Zoöl., LXIII, pp. 151–225).—1 specimen, Ellice Is. (Hull, 1910, Proc. Linn. Soc. New So. Wales, p. 34).

F.—EASTERN POLYNESIA

(1) COOK ISLANDS:—1 specimen, Raratonga, July, 1895 (Rothschild Collection).—1 ♂, 1 ♀, Raratonga, Feb. 14, 20, 1903, by Seale (A.M.N.H.).—1 specimen, Palmerston I., April 16, 1779 (Cook).—1 specimen, Raratonga (1905, Ibis, p. 600; 1859, Gray, B. of Trop. Is., p. 35; Finsch and Hartlaub, 1879, Orn. Cent. Poly., p. 27; id., 1870, Journ. f. Ornith., p. 122).

(2) SOCIETY ISLANDS:—6 ♂, 1 ♀, Moorea, June 23, July 7, 15, 20, Oct. 31, 1921.—1(?), Mehetia (Maitea), Jan. 29, 1923.—3 ♂, 4 ♀, Tahiti, March 15, May 31, Aug. 13, Sept. 2, Nov. 23, 1921, Jan. 8, 12, 1923 (all Whitney S. S. Exp.).—2 specimens, Tahiti, 1850, by Ribourt (Mus. d'Hist. Nat., Paris).—2 specimens, Tahiti, 1843, by "La Danaide" (Mus. d'Hist. Nat., Paris).—1 specimen, Tahiti, 1847, by Arnou (Mus. d'Hist. Nat., Paris).—1 specimen, Tahiti (Rothschild Collection).

(3) AUSTRAL ISLANDS:—2 ♂, 1 ♀, Rimitara, March 24, 25, 1921.—4 ♂, 1 ♀, Tubuai, April 5, 6, May 3, 1921.—5 ♂, Ravavai, April 25, 26, 1921.—1 ♂, 1 ♀, 1(?), Vavitao, April 25, 1920.—1 ♂, 1 (?), Rapa Is., April 16, 18, 1921 (all Whitney S. S. Exp.).—At Pitcairn I., acc. to natives (Hull, 1910, Proc. Linn. Soc. New So. Wales, XXXIV, p. 34).

(4) TUAMOTU ARCHIPELAGO:—1 ♂, Mangareva, May 8, 1922.—1 ♀, Maria, May 31, 1922.—1 (?), Tenarunga, June 14, 1922.—1 ♂, Makatea, Aug. 21, 1922.—1 ♀, Takapotu, Aug. 29, 1922.—1 ♂, Hiti, May 4, 1923.—1 ♀, Takume, May 11, 1923.—1 ♂, Makemo, May 21, 1923.—2 ♂, Katiu, May 25, 1923.—1 ♂, Taiaro,

May 28, 1923.—1 ♂, June 4, 1923.—1 ♀, Apataki, June 9, 1923.—1 ♂, Takahau, June 21, 1923 (all Whitney S. S. Exp.).

(5) MARQUESAS ISLANDS:—2 specimens, Nukuhiva, 1848, by M. Mercier (Mus. d'Hist. Nat., Paris).—Mentioned (Finsch and Hartlaub, 1867, Orn. Cent. Poly., 27; id., 1870, Journ. f. Ornith., p. 122).—Mentioned (Fulton, 1903, Trans. N. Z. Inst., XXXVI, pp. 115–148; Gray, 1859, B. of Trop. Is.).

From the specimens that I have examined, only one out of 37 from Melanesia was found during its breeding season (Feb.). From Micronesia, only 2 specimens out of 9 were found during the breeding season (Dec.). From Polynesia, 3 were collected in Dec., 5 in Jan., 2 in Feb.—which is a small percentage of the 134 specimens found there.

Therefore it seems evident that the majority migrates to Polynesia, some others as far as Melanesia, Micronesia and the stragglers winter in the islands of the New Zealand region. The number of specimens collected in Polynesia are found to be about equally divided numerically between Central and Eastern Polynesia. Those remaining throughout the breeding season in their winter quarters are usually immature birds. No specimen has yet been found in Australia, New Guinea or farther west.

HISTORY OF MIGRATION

It is not known when *Urodynamis taitenis* originally came to New Zealand or Polynesia. It is undoubtedly closely related to *Eudynamis scolopacea* which occurs eastward as far as Australia, the Papuan region and Northern Melanesia.

Most subtropical and temperate-zone cuckoos of the Southern Hemisphere are migratory. They live mostly on caterpillars which are not available in their breeding area during winter. This may be the reason why they migrate, but it is much more difficult to explain the origin of the extensive migrations of these island birds than the origin of the small movements of continental birds. At the present time the migrations of this species seem to extend much beyond the necessary distance. With plenty of food available at the Fiji, Tonga and Samoa Islands, there seems to be no reason why some birds embark on the perilous journey to such isolated, outlying islands, as Palau, Reef, the Marshall Islands and the Marquesas. Individuals that venture past these islands would unquestionably perish in the endless ocean that stretches beyond. Birds that winter on these outlying islands travel more than 8000 miles between breeding seasons, most of it over open water. Here is another fertile field for the student of the problem of "homing."

The migration of *Urodynamis taitensis* is quite similar to that of the other New Zealand cuckoo, *Chalcites lucidus*. The bronzed cuckoo, however, goes only as far as the Solomon Islands and the Bismarck Archipelago (see Mayr, 1932, Amer. Mus. Novit., No. 520, pp. 3–5).